

SUPPORT FOR THE AMENDMENTS

This Amendment cancels Claim 8; and amends Claims 1-7 and 9-15. Support for Claims 1-3 is found in the specification at least at [0035]. Support for Claim 7 is found in the specification at least at [0025]. No new matter would be introduced by entry of these amendments.

Upon entry of these amendments, Claims 1-7 and 9-15 will be pending in this application. Claim 1 and 7 are independent.

REMARKS/ARGUMENTS

The present invention provides amorphous silica particles having high oil absorbance capabilities. Specification at [0001]. The present inventors have discovered that amorphous silica particles having an oil absorption of 400ml/100g or more can be made by making amorphous silica particles having an oil absorption of 340ml/100g or more and baking these silica particles at 200 to 990C. Specification at [0008]. For the baked amorphous silica particles, the maximum value of $\Delta V_p / \Delta \log R_p$ is 250 mm³/nm·g or more in the pore distribution curve obtained by the nitrogen adsorption isotherm method, and pore peak radius when the $\Delta V_p / \Delta \log R_p$ value is maximum is 15 to 100 nm.

Claims 1-4 and 7-9 are rejected under 35 U.S.C. § 102(b) over JP 06-040714 ("JP-714").

Claims 1-4 are rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 6,413,373 ("Matsuda").

Claims 1-4 and 7-9 are rejected under 35 U.S.C. § 102(b) over WO 01/17901 ("WO-901").

Claims 1-4 and 7-9 are rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 6,107,236 ("Pecoraro").

The Office Action has miscalculated $\Delta V_p / \Delta \log(R_p)$ for the cited prior art.

Figures 1 to 3 of the present invention show N_2 absorption curves with $\Delta V_p / \Delta \log(R_p)$ at the y-axis and ΔR_p at the x-axis. When measuring N_2 absorption a scan is made over a defined pore peak radius range and for each pore radius it is recorded how much N_2 is absorbed by pores having said specific radius. If there are many pores having a specific radius, a lot of N_2 is absorbed at once. If there are only a few pores having another specific radius, much less N_2 is absorbed. The difference in N_2 -absorption is reported as a ΔV_p value. The variation of R_p and also of V_p is symbolized by the symbol Δ .

In miscalculating $\Delta V_p / \Delta \log(R_p)$, the Office Action incorrectly used the total pore volume ($V_{p-total}$), instead of the variation of the pore volume at a specific pore radius (ΔV_p), to calculate $\Delta V_p / \Delta \log(R_p)$. The Office Action regarded the total pore volume, i.e. the N_2 absorbed by the sum of all pores, as ΔV_p . Such calculation would only be correct if all pores of a silica would have an identical pore radius. This is without doubt unrealistic. In reality ΔV_p for each specific pore radius is much lower than the total pore volume.

JP-714 discloses a method for preparation of silica including a drying step under supercritical conditions (see JP-714 at [0019]). In contrast, the silica of the present invention are dried conventionally (see specification at [0024]) followed by a heat treatment. In JP-714 no heat treatment was done after drying. This shows that the processes of the present invention and that of JP-714 are not identical.

The products of the present invention and the silica of JP-714 are not identical, too. The silica of JP-714 exhibits a high oil absorption. Their pore peak radius, however, is much lower than that of the silica claimed in amended claim 1 of the present invention. As confirmed by Table 1 of JP-714, the silica of Example 1 has a pore radius of 9.3 nm (i.e., half of a diameter of 18.6 nm), which is far below the independent Claim 1 range of "15 to 100

nm". JP-714 fails to suggest the independent Claim 1 limitation that "the pore peak radius when the $\Delta V_p/\Delta \log R_p$ value is maximum is 15 to 100 nm".

The larger pore peak radius of the silica according to amended Claim 1 of the present invention is essential since too small pores have too strong capillary forces which cause delay in release of the absorbed active ingredient.

Thus the combination of high oil absorption and large pore peak radius is new and inventive over JP-714.

Matsuda is silent with regard to ΔV_p (note discussion above). What is reported in Matsuda are total pore volume values absorbed by pores having a radius of from 10 to 100nm (given in Matsuda as diameters) respectively of pores having a radius of from 300 to 4000nm (see Matsuda , column 4, lines 1 to 16). Matsuda is silent at which R_p the maximum of $\Delta V_p/\Delta \log(R_p)$ is reached, too.

As explained above, the Office Action's calculation of $\Delta V_p/\Delta \log(R_p)$ is incorrect because total pore volume was used instead of ΔV_p . In addition Matsuda reports Hg-absorption values instead of N_2 -absorption values. Both methods deliver totally different values for V_p so that it is impossible to simply compare Hg-porosimetry values with N_2 -porosimetry values.

In Matsuda at column 14, Table 2, is disclosed that the maximum amount of Hg is absorbed by pores having a pore radius R_p of from 300 to 4000 nm. Thus - even though ΔV_p is not explicitly disclosed in Matsuda - there is strong evidence that R_p for the maximum of $\Delta V_p/\log(\Delta R_p)$ of the silica of Matsuda is in the range of 300 to 4000 nm. This is clearly outside of independent Claim 1's range of "15 to 100 nm". This interpretation is supported by the explanations in Matsuda at column 4, lines 1 to 13.

Thus, Matsuda fails to disclose or suggest all the limitations of the claimed invention.

WO-901 discloses inorganic oxides having pores with a pore radius of from 1 to 12.5 nm (see WO-901 at page 7, lines 1 to 2). In contrast, independent Claim 1 recites "the pore peak radius when the $\Delta V_p/\Delta \log R_p$ value is maximum is 15 to 100 nm". Thus the pores of the present invention are significantly larger than the pores of the oxides of WO-901.

The Office Action alleges in item 11 that WO-901 would disclose in table 1, col. 6, a maximum pore diameter of 18 nm. It is important to realize, that in independent Claim 1 the maximum pore radius is claimed and not the maximum pore diameter.

Note that independent Claim 1 features "amorphous" silica. The inorganic oxides of WO-901 show X-ray patterns (see WO-901 at Figures 1A, 2A, 3A, 4, 5, 6 and 7) indicating that they are crystalline and not amorphous.

Therefore the claims of the present invention are new and inventive over WO-901.

Pecoraro discloses in column 10, lines 27 to 29, a maximum pore radius measured by N₂-absorption of from 3 to 12.5 nm. In contrast, independent Claim 1 recites "the pore peak radius when the $\Delta V_p/\Delta \log R_p$ value is maximum is 15 to 100 nm". This is clearly outside the teaching of Pecoraro. Again, it is important to realize, that in Claim 1 the maximum pore radius is claimed and not the maximum pore diameter.

A larger pore peak radius allows faster absorption rates. In addition, if the pore peak radius is too small, capillary forces are too strong so that incomplete desorption or very slow desorption may be observed. Thus, the silica of Pecoraro cannot be used properly as carries for highly viscose liquids like vitamins etc..

As consequence the present invention is clearly new and inventive over Pecoraro.

Because the cited prior art fails to disclose or suggest all the limitations of the claimed invention, the rejections over each of JP-714, Matsuda, WO-901 and Pecoraro should be withdrawn.

Claims 5-6 and 10-15 are objected to under 37 C.F.R. § 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. To obviate the objection, Claims 5-6 and 10-15 are amended by deleting the multiple dependencies.

Claims 7-9 are rejected under 35 U.S.C. § 112, first paragraph, as based on a disclosure which is not enabling. In addition, Claims 7-9 are rejected under 35 U.S.C. § 112, first paragraph, because assertedly the specification, while being enabling for baking silica particles having an oil absorption of at least 340ml/100g at 200-990°C and for 10 minutes to 5 hours, does not reasonably provide enablement for a baking step under the same conditions with any other silica particles. Furthermore, Claims 7-9 are rejected under 35 U.S.C. § 112, second paragraph, because the recitation "silica particles are bake" is not a positive process limitation. To obviate the rejections, Claim 7 is amended to recite "baking silica particles having an oil absorption of at least 340ml/100g at 200 – 990°C for 1 minute to 10 hours".

The drawings are objected to as not of sufficient quality to permit examination. To obviate the objection, replacement sheets for the drawings were filed November 26, 2007.

Claims 1-4 and 7-9 are provisionally rejected on the ground of non-statutory obviousness-type double patenting over Claims 1-8 of co-pending Application No. 10/566,373. Pursuant to M.P.E.P. § 823, when the provisional rejection is the only rejection remaining in the above-identified application, Applicants respectfully request withdrawal of the provisional rejection.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the application is in condition for allowance. Applicants respectfully request favorable consideration and prompt allowance of the application.

Should the Examiner believe that anything further is necessary in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,

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A handwritten signature in cursive script that reads "Corwin Paul Umbach". The signature is written in dark ink and is positioned above a horizontal line.

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